

14. FRÖDERSTRÖM, H. The Genus *Sedum* L. Pt. I. Acta Horti Gothob. 5, Append.: 1-75. 1930.
15. ———. The Genus *Sedum* L. Pt. III. Acta Horti Gothob. 7, Append.: 1-126. 1932.
16. ———. The Genus *Sedum* L. Pt. IV. Acta Horti Gothob. 10, Append.: 1-262. 1935.
17. GRAY, ASA. Miscellaneous Botanical Contributions. Proc. Amer. Acad. Arts and Sciences 11: 71-104. 1876.
18. JEPSON, W. L. Manual of the Flowering Plants of California. San Francisco. Independent Pressroom and Williams Printing Co. 1925.
19. MAURITZON, JOHAN. Studien über die Embryologie der Familien Crassulaceae und Saxifragaceae. Lund. 1933.
20. MICHAUX, ANDREAS. Flora Boreali-Americana, I. Parisiis et Argentorati, apud fratres Levrault. 1803.
21. NUTTALL, THOMAS. Genera of North American Plants, I. Philadelphia. D. Heath. 1818.
22. PURSH, FREDERICK. Flora Americae Septentrionalis. London. White, Cochrane, and Co. 1814.
23. ROCÉN, TH. Beitrag zur Embryologie der Crassulaceen. Svensk. Bot. Tidskr. 22: 368-376. 1928.
24. ROSE, J. N. in Britton, N. L. and J. N. Rose. Crassulaceae. North American Flora 22: 7-74. 1905.
25. SCHÖNLAND, S. Crassulaceae. Die natürlichen Pflanzenfamilien 3(2a): 23-38. 1891.
26. SHARSMITH, HELEN K. The Genus *Sedella*. Madroño 3: 1-8. 1936.
27. ———. Further Notes on the Genus *Sedella*. Madroño 5: 192-196. 1940.
28. TORREY, JOHN and ASA GRAY. Flora of North America. New York. Wiley and Putnam. 1840.
29. VAN TIEGHEM, P. Sur le genre *Penthore*, considéré comme type d'une famille nouvelle, les *Penthoracées*. Ann. Sci. Nat. (8 Sér. Bot.) 9: 371-376. 1899.

FURTHER NOTES ON THE GENUS SEDELLA

HELEN K. SHARSMITH

A NEW SPECIES OF SEDELLA

In May, 1936, shortly after publication of "The Genus *Sedella*" (Madroño 3: 240-248. 1936), a *Sedella* collected by Milo S. Baker in Lake County, California, was received for examination. Its five stamens indicated an affinity with *Sedella pentandra* of the Mount Hamilton Range, although differences were obvious. The material was too mature and too scant, however, for complete study. Mr. Baker recently re-collected this *Sedella* at the same locality, and sent fresh plants from which full diagnosis was possible. On the basis of these two collections, a fourth species is described below for the genus *Sedella*:

Sedella leiocarpa sp. nov. Herba annua erecta glabra succulenta, 3-5 cm. alta; caulis validus simplex vel ramosus, ramis e nodis inferioribus oppositis uni- vel bijugatis, quam caule primario brevioribus; cymae terminales subracemosae, simplices vel ramosae; flores conferti secundi biseriales sessiles, 3.5-4.0 mm. longi, 3-4 mm. lati; hypanthium brevicampanulatum; petala

ad basim connata, flavida dorsaliter medio rubrovittata lanceolata acuminata, 3–3.5 mm. longa, per anthesin patentia, post anthesin erecta, fructu paullo patentia; nectaria epipetala rubrescentia complanata, 0.5–0.8 mm. longa, apice lato truncato emarginatove; stamina 5 epipetala; carpella 1.5–2.0 mm. longa, glabra laevigata; stylus erectus 0.3–0.4 mm. longus; folliculi paullo patentis laevigati rubescentes, 2.0–3.0 mm. longi; semina solitaria.

Erect or spreading, glabrous, succulent, reddish annual 3–5 cm. tall; root system spreading, fibrous, 0.5–1.5 cm. in diameter; hypocotyl 1–1.5 cm. long; stem stout, simple or with one or two pairs of spreading branches in lower nodes, these usually shorter than main stem; cauline leaves sessile, entire, very fleshy, oblong-ovoid, obtuse, 4–5 or more mm. long, 3 mm. wide, gibbous at base, opposite below, alternate above, caducous; terminal inflorescence a bracteate, falsely racemose cyme occasionally with one to two or more branches, similar inflorescences terminating lower stem branches; bracts of the inflorescence like cauline leaves but progressively smaller and more acute toward branch tips, persistent through flowering stage; flowers crowded, secund in two rows, alternate, 3.5–4 mm. long, 3–4 mm. wide, subsessile; hypanthium shallow, campanulate; sepals 5, triangular acute, 0.5 mm. long; petals coalesced at base, pale yellow, dorsally suffused with red, lanceolate, acuminate, 3–3.5 mm. long, spreading in anthesis, erect in early fruit, appressed to spreading carpels in mature fruit; nectaries epipetalous, reddish, flattened, 0.5–0.8 mm. long, apex broadened, glandular, truncate to erose or somewhat emarginate; stamens 5, epipetalous, 1.5–2 mm. long, anthers yellow, filaments capillary; carpels 5, free, light green, erect, approximate, 1.5–2 mm. long, glabrous, smooth, style erect, 0.3–0.4 mm. long; follicles reddish, 2–3 mm. long, 1-seeded, spreading, glabrous, suture sharply keeled; seeds erect, light brown, oblong clavate, microscopically striate, 1–1.3 mm. long.

Type. Dry, rocky soil in chaparral, 6.5 miles north of Lower Lake, Lake County, California, May 3, 1938, *Milo S. Baker 8971* (Herb. Univ. Calif. no. 592627, isotypes at Calif. Acad. Sci. and Gray Herbarium), plants in flower and early fruit. Topotype. April 26, 1936, *Milo S. Baker* (Herb. Univ. Calif. no. 592628), plants in fruit.

Although the generic affinities of *Sedella leiocarpa* are readily recognized, the species is clearly separable from the other three members of the genus, particularly in its completely glabrous carpels and large, red nectaries. The five stamens and erect, short style link it closely to *S. pentandra*, but the hypanthium is campanulate as in the ten-stamened *S. pumila* and *S. Congdoni*, not turbinate as in *S. pentandra*, and the petals are almost as large as those of *S. pumila*. The growth form resembles that of *S. pentandra* and *S. pumila* with the plants even shorter than in *S. pen-*

tandra, but as stout as in *S. pumila*. A key to the five-stamened species of the genus *Sedella* is given below:

Carpels glandular papillate; petals 2 mm. long; follicles appressed	<i>S. pentandra</i> .
Carpels glabrous; petals 3-3.5 mm. long; follicles somewhat spreading	<i>S. leiocarpa</i> .

AN EXTENSION OF THE KNOWN RANGE OF SEDELLA PENTANDRA

Sedella pentandra, as first described (Madroño 3: 240. 1936), was known only from the Mount Hamilton Range of the inner South Coast Range of California. It was reported subsequently by John Thomas Howell (Leaflet West. Bot. 2: 99. 1938) from The Pinnacles, San Benito County (*J. T. Howell 12939*, Herb. Calif. Acad. Sci.; Herb. Univ. Calif.). The Pinnacles are in the Gavilan Range, the unit of the South Coast ranges which lies between the San Carlos Range and the Santa Lucia mountains.

Mr. Milo S. Baker recently collected *Sedella pentandra* in the inner North Coast Range of California (near Lakeport, Lake County, May 1, 1938, *M. S. Baker 8957*, Herb. Univ. Calif.; Herb. Calif. Acad. Sci.), and sent me fresh plants for study. Except that branching is somewhat more common, the North Coast Range plants show no variation from the South Coast Range plants. The habitats involved are essentially similar.

THE STATUS OF THE GENUS SEDELLA BRITTON AND ROSE

Botanical opinion continues to vary as to the generic validity of *Sedella*. In the most recent treatment of *Sedum*, *Sedella* is included in *Sedum* as the section *Sedella* Berger (Fröderström, H., *Acta Horti Gotoburgensis* 10, append.: 80. 1935). *Sedella Congdoni*, reduced again to varietal status, is given the new combination, *Sedum pumilum* var. *Congdoni* (Eastw.) Fröderström. Britton and Rose (*North American Flora* 22: 7-74. 1905) recognize at least nine segregates of *Sedum* as genera, among them *Sedella*, but Fröderström, considering floral structure of predominant importance, presents an even more inclusive view of *Sedum* than does Berger in *Die Natürlichen Pflanzenfamilien* (ed. 2, 18A: 436-462. 1930).

Sedella has far more claim to generic distinction than many of the segregates of *Sedum*, but if the flower is the sole criterion used to determine generic boundaries between *Sedum* and its allies, many of the morphological features which combine to form an easily recognized unit of *Sedella* must be disregarded. When all available morphological evidence is evaluated with genetical, geographical and other data, however, *Sedella* appears to represent a small, distinct, natural genus of plants. It seems well, therefore, to review with greater detail than has been done, the morphological bases upon which the genus *Sedella* rests.

The always single, basally attached, erect seeds of *Sedella*

form the chief technical basis for separating the genus from *Sedum*. This criterion distinguishes *Sedella* whether *Sedum* is viewed broadly or is divided into some or all of its numerous segregates. In *Sedum* and its other allies, the seeds are several to many and horizontal, with the one exception of *Telmisa*, a monotypic genus (or section) intermediate between *Sedum* and *Tillaea* and native to Asia Minor; in *Telmisa* the seeds are single and pendant.

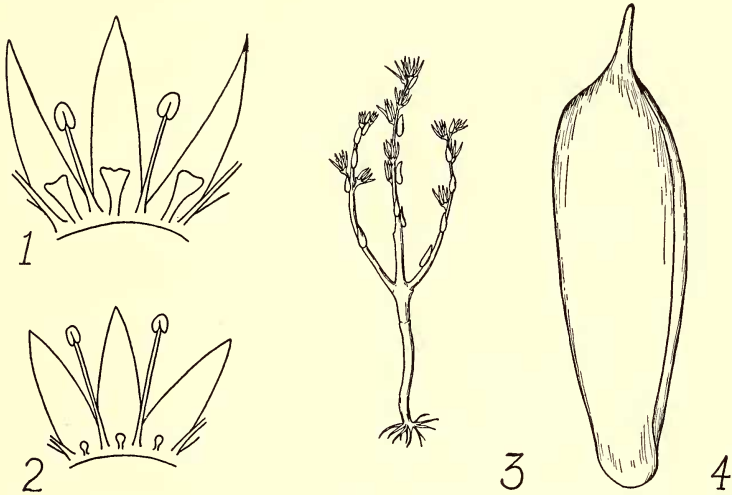


FIG. 1. *Sedella leiocarpa*: 1, portion of corolla showing attachment of stamens and nectaries, $\times 7$; 2, *S. pentandra*, same, $\times 7$; 3, *S. leiocarpa*, habit, $\times 0.7$; 4, *S. leiocarpa*, follicle, $\times 21$.

In all four species of *Sedella*, the nectaries, which probably represent staminodia, are attached to the slightly sympetalous corolla opposite the carpels (see text figs. 1, 2). They apparently correspond to the so-called receptacle scales or hypogynous scales commonly regarded in the Crassulaceae as appendages of the carpels. Rendle (Class. Fl. Pl. vol. 2, 315. 1935) speaks of the fleshy habit and "the nectar-secreting appendages of the carpels" as the two most distinctive characteristics of the Crassulaceae. Evidence is lacking as to whether or not the epipetalous insertion of the nectaries is peculiar to *Sedella*, but references imply that receptacular attachment is the common mode of insertion in *Sedum* and in the Crassulaceae as a whole.

The strictly annual habit of *Sedella* forms a point of contrast with the typically perennial nature of *Sedum* and related groups. In addition, there is a complex of minor morphological characteristics which assists in knitting the species of *Sedella* into a closely bound biological unit. Familiarity with the living plants in their native environment is necessary to appreciate this com-

plex fully; although it is difficult to select and describe individual characteristics, the following stand out: the diminutive stature; the small, disc shaped root system; the reddish stems with few to many erect or spreading branches; the caducous, gibbous leaves, opposite below and alternate above; the bracts which persist through the flowering stage; the small, pentamerous, sessile or subsessile flowers; the fleshy hypanthium; the minute, triangular calyx teeth; the persistent, slightly sympetalous, yellowish corolla with lanceolate or ovate-lanceolate lobes; the five to ten epipetalous, yellow-anthered stamens; and the distinct, clavate carpels.

In geographic distribution and in ecological requirements, as well as in morphological features, the genus *Sedella* forms a distinguishable unit. The four species are all endemic to the foothills and adjacent plains of central California, and their very similar and restricted habitats are not shared by other Californian genera of the Crassulaceae.

Department of Botany,
University of California, Berkeley,
October 16, 1938.

PRISCILLA AVERY

Priscilla Avery was born in Redlands, California, on June 12, 1899. One of five children, she was brought up in a cultural and intellectual atmosphere; her father, Lewis B. Avery, is a well known educator, a sister, a talented musician, and a brother, a noted inventor. Always distinguished in her academic work, Miss Avery held a Levi Strauss scholarship as an undergraduate at the University of California; she was elected to Phi Beta Kappa in her junior year, and at her graduation in 1926 she received highest honors in the College of Agriculture. She was a member of Sigma Xi and Phi Sigma science honor societies, also of the American Association for the Advancement of Science and the California Botanical Society.

As a graduate student, she carried on research in the field of genetics at the University of California, receiving the degree of Doctor of Philosophy in May, 1930. She was a teaching fellow in zoology and an assistant in the Division of Genetics during the academic year, 1927-1928. From 1928 to 1934 she held the position of preparator in the Department of Botany, and from 1934 until her death on December 29, 1939, she was cytologist for the University of California Botanical Garden.

While associated with the Division of Genetics of the College of Agriculture, her work was concerned with interspecific hybrids in *Crepis* with special reference to chromosome morphology. Later, after taking up her position with the Department of Botany and finally with the Botanical Garden she worked almost